Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the above-identified application.

Listing of Claims

1.   (Currently Amended) A method comprising:

maintaining a <u>synchronous</u> copy of a data change log at a primary node, wherein

said data change log at said primary node is associated with a primary data

volume of said primary node[[,]]<u>;</u> and

said <u>synchronous</u> copy of said data change log is maintained at a data

recovery node;

~~detecting a failure of said primary data volume; and~~

<u>asynchronously</u> updating a secondary data volume of a secondary node using said

<u>synchronous</u> copy of said data change log ~~in response to said detecting~~.

2.   (Currently Amended) The method of claim 1, wherein said ~~maintaining comprises: maintaining a real-time copy of said data change log at said primary node~~ <u>secondary data volume is updated in response to detecting a failure of the primary data volume</u>.

3.   (Cancelled)

4.   (Currently Amended) The method of claim [[3]] <u>1</u>, wherein said maintaining said ~~real-time~~ <u>synchronous</u> copy comprises:

receiving a request to perform a write operation on said primary data volume;

storing data associated with said write operation substantially simultaneously on

said data change log and said ~~real-time~~ <u>synchronous</u> copy of said data

change log in response to said receiving.

5.   (Cancelled)

6.   (Cancelled)

7.   (Currently Amended) The method of claim [[3]] 2, wherein said updating comprises:

  receiving a manual update initiation indication; and

  updating said secondary data volume using said real-time copy of said data

    change log in response to said receiving.

8.   (Currently Amended) The method of claim [[3]] 1, wherein

  said real-time synchronous copy of said data change log comprises a plurality of

    entries; and

  said updating comprises:

    identifying an entry of said plurality of entries as corresponding to an

      incomplete write operation on said primary data volume[[,]]; and

    updating said secondary data volume using said entry.

9.   (Currently Amended) The method of claim[[3]] 1, wherein said updating comprises:

  copying a block of data from said synchronous copy of said data change log to a

    staging log at said secondary node, said block of data comprising a

    plurality of entries;

  applying each of said plurality of entries to a data change log at said secondary

    node in response to said copying; and

  updating said secondary data volume using said data change log at said secondary

    node.

10.   (Currently Amended) The method of claim [[3]] 2, further comprising:

  detecting a recovery of said primary data volume; and

  resynchronizing said primary data volume and said secondary data volume in

    response to said detecting.

Application No.: 10/788,697

11.   (Currently Amended) A machine-readable medium ~~having~~ comprising a plurality of instructions ~~executable by a machine embodied therein~~, wherein said plurality of instructions when executed ~~cause said machine to perform~~ implement a method comprising:

maintaining a synchronous copy of a data change log at a primary node, wherein

said data change log at said primary node is associated with a primary data

volume of said primary node[[,]]; and

said synchronous copy of said data change log is maintained at a data

recovery node;

~~detecting a failure of said primary data volume; and~~

asynchronously updating a secondary data volume of a secondary node using said

synchronous copy ~~of said data change log in response to said detecting~~.

12.   (Currently Amended) The machine-readable medium of claim 11, wherein said ~~maintaining comprises: maintaining a real-time copy of said data change log at said primary node~~ secondary data volume is updated in response to detecting a failure of the primary data volume.

13.   (Cancelled)

14.   (Currently Amended) The machine-readable medium of claim [[12]] 11, wherein said maintaining said ~~real-time~~ synchronous copy comprises:

receiving a request to perform a write operation on said primary data volume;

storing data associated with said write operation substantially simultaneously on

said data change log and said ~~real-time~~ synchronous copy of said data

change log in response to said receiving.

15.   (Cancelled)

16.   (Cancelled)

17.　(**Currently Amended**) The machine-readable medium of claim [[12]] 11,
wherein

said ~~real-time~~ synchronous copy of said data change log comprises a plurality of

entries; and

said updating comprises:

identifying an entry of said plurality of entries as corresponding to an

incomplete write operation on said primary data volume[[,]]; and

updating said secondary data volume using said entry.

18.　(**Currently Amended**) The machine-readable medium of claim [[12]] 11,
wherein said updating comprises:

copying a block of data from said ~~real-time~~ synchronous copy of said data change

log to a staging log at said secondary node, wherein said block of data

~~comprising~~ comprises a plurality of entries;

applying each of said plurality of entries to a data change log at said secondary

node in response to said copying; and

updating said secondary data volume using said data change log at said secondary

node.

19.　(**Currently Amended**) A data processing system comprising:

means for maintaining a synchronous copy of a data change log at a primary

node, wherein

said data change log at said primary node is associated with a primary data

volume of said primary node[[,]]; and

said synchronous copy of said data change log is maintained at a data

recovery node;

~~means for detecting a failure of said primary data volume; and~~

means for asynchronously updating a secondary data volume of a secondary node

using said synchronous copy of said data change log ~~in response to a~~

~~failure of said primary data volume.~~

20. (Currently Amended) The data processing system of claim 19, wherein ~~said means for maintaining comprises: means for maintaining a real-time copy of said data change log at said primary node~~ secondary data volume is updated in response to detecting a failure of the primary data volume.

21. (Cancelled)

22. (Currently Amended) The data processing system of claim [[21]] 19, wherein said means for maintaining said ~~real-time~~ synchronous copy comprises:

      means for storing data associated with a requested write operation on said primary data volume substantially simultaneously on said data change log and said real-time copy of said data change log.

23. (Cancelled)

24. (Cancelled)

25. (Currently Amended) The data processing system of claim [[21]] 19, wherein said ~~real-time~~ synchronous copy of said data change log comprises a plurality of entries; and

said means for updating comprises:

      means for identifying an entry of said plurality of entries as corresponding to an incomplete write operation on said primary data volume[[,]] ; and

means for updating said secondary data volume using said entry.

26. **(Currently Amended)** The data processing system of claim [[21]] 19, wherein said means for updating comprises:

> means for copying a block of data from said real-time synchronous copy of said data change log to a staging log at said secondary node, said block of data comprising a plurality of entries;
>
> means for applying each of said plurality of entries from said staging log to a data change log at said secondary node; and
>
> means for updating said secondary data volume using said data change log at said secondary node.

27. **(Currently Amended)** A data processing system comprising:

> a storage element to store a synchronous copy of a data change log at a primary node, wherein said data change log at said primary node is associated with a primary data volume of said primary node; and
>
> a recovery module configured to asynchronously update a secondary data volume of a secondary node using said synchronous copy of said data change log in response to a failure of said primary data volume.

28. **(Currently Amended)** The data processing system of claim 27, wherein said storage element comprises: a storage element to store a real-time copy of said data change log at said primary node recovery module updates the secondary data volume in response to a failure of said primary data volume.

29. **(Currently Amended)** The data processing system of claim [[28]] 27, further comprising:

> a volume management module configured to mirror data to be written to said data change log to said synchronous real-time copy of said data change log.

30. **(Cancelled)**

Application No.: 10/788,697

31.   (**Currently Amended**) The data processing system of claim [[28]] 27, wherein said synchronous ~~real-time~~ copy of said data change log comprises a plurality of entries; and

said recovery module comprises a failover management module configured to identify an entry of said plurality of entries as corresponding to an incomplete write operation on said primary data volume and update said secondary data volume using said entry.

32.   (**Currently Amended**) The data processing system of claim [[28]] 27, wherein said recovery module comprises:

a failover management module configured to copy a block of data comprising a plurality of entries from said real-time copy of said data change log to a staging log at said secondary node.

33.   (**Cancelled**)

34.   (**Cancelled**)

35.   (**Currently Amended**) A method comprising:

maintaining a synchronous copy of a data change log at a primary node, wherein said data change log at said primary node is associated with a primary data volume of said primary node[[,]] ; and

said synchronous copy of said data change log is maintained at a data recovery node; and

asynchronously replicating data to be written to said primary data volume from said primary node to said secondary node.

36.   (**Cancelled**)

37.   (**Currently Amended**) The method of claim [[36]] 35, further comprising: detecting a failure of said primary data volume; and

updating a secondary data volume of said secondary node using said synchronous ~~real-time~~ copy of said data change log in response to said detecting.